Bahçeşehir University, Istanbul, Turkey
Analysis & PDE Center, Ghent University, Ghent, Belgium
Institute Mathematics & Math. Modeling, Almaty, Kazakhstan

"Analysis and Applied Mathematics"
Weekly Online Seminar

Seminar leaders:
Prof. Allaberen Ashyralyev (BAU, Istanbul),
Prof. Michael Ruzhansky (UGent, Ghent),
Prof. Makhmud Sadybekov (IMMM, Almaty)

Date: **Tuesday, November 14, 2023**
Time: 12.00-13.00 (Istanbul) = 10.00-11.00 (Ghent) = 15.00-16.00 (Almaty)

Zoom link: https://us02web.zoom.us/j/6678270445?pwd=SFNmQUIvT0tRaH-lDaVYrN3l5bzJVQT09, **Conference ID:** 667 827 0445, **Access code:** 1

Speaker:
Prof. Dr. Giuseppe Di Fazio
University of Catania - Italy

Title: **Regularity for elliptic equations under minimal assumptions**

Abstract: We will review regularity results for linear and quasilinear uniformly elliptic equations. Focus is on the *minimal assumptions* we need to obtain a given degree of smoothness for generalized solutions of a given elliptic equation. Our main linear equation is

$$\text{div}A(x, u, \nabla u) + B(x, u, \nabla u) = 0$$

where

$$\begin{cases} |A(x, u, \xi)| \leq a|\xi|^{p-1} + b|u|^{p-1} + e \\ |B(x, u, \xi)| \leq c|\xi|^{p-1} + d|u|^{p-1} + g \\ \quad \xi \cdot A(x, u, \xi) \geq |\xi|^p - d|u|^p - g \end{cases}$$

where a is a real constant and b, c, d, e, g are given functions.

Biography:

Giuseppe Di Fazio was born in Catania in 1963. He obtained his degree in Mathematics (University of Catania) in 1986 with 110/110 cum laude and his PhD in 1992 in Mathematics - Partial Differential Equations under the supervision of Professor Filippo Chiarenza - University of Catania. He worked as Assistant Professor from 1992, Associate Professor from 1998, and Full Professor from 2007 at the University of Catania. He is currently the Chair of Master program in Mathematics at the University of Catania.

Prof. Giuseppe Di Fazio was a Visiting Professor in Italy at University of Bologna, University of Firenze, Politecnico di Milano, Università di Napoli, Università di Salerno, Università di Urbino, Università di Trento. He was also a Visiting Professor at Temple University (Philadelphia PA), **MSRI** (Berkeley CA), Università Autonoma de Madrid, Tokyo Metropolitan University, Tokyo University of Sciences, Chuo University in Tokyo, University of Kyoto, **KAUST** (Saudi Arabia), Bandung Institute of Technology **ITB** (Indonesia), University of Coimbra (Portugal).

Prof. Giuseppe Di Fazio's research interests are about regularity problems for elliptic PDEs and boundedness properties of integral operators acting on Morrey spaces. He is an author of the books:

1. Yoshihiro Sawano, Giuseppe Di Fazio, Denny Ivanal Hakim. Morrey Spaces : Introduction and Applications to Integral Operators and PDE's, Volume I, ISBN: 9781498765510, Taylor & Francis (2020)
2. Yoshihiro Sawano, Giuseppe Di Fazio, Denny Ivanal Hakim. Morrey Spaces : Introduction and Applications to Integral Operators and PDE's, Volume II, ISBN: 9780367459154, Taylor & Francis (2020).